

WHAT WE CLAIM IS

1. A cylinder lock, including:
  - a housing having a cylindrical bore therein;
  - a rotor assembly rotatably mounted within said bore;
  - a plurality of locking bars arranged on said rotor assembly, each locking bar including a locking bar pin directed radially inward towards the axis of said rotor assembly, wherein each locking bar is displaceable on the rotor assembly in a direction substantially parallel with said axis, and each locking bar is displaceable in a radial direction with respect to said axis; and
  - a combination post arranged along said axis, said combination post having a plurality of combination holes formed thereon;
  - wherein each of said locking bars is adapted to be displaced by a coded key, in said substantially parallel direction, to a position in which the locking bar pin of each said locking bars is directed towards a respective combination hole; said rotor assembly is adapted to be rotated by said key to an unlocking position, wherein at various rotational positions each said locking bar is radially displaced towards said axis, thereby engaging each said locking bar pin with a respective combination hole, so as to permit rotation of said rotor assembly within said bore.
2. The cylindrical lock according to claim 1, wherein said lock is adapted to allow said key to be inserted into and removed from said lock only when said rotor assembly is in a first rotational position.
3. The cylinder lock according to claim 1 or 2, wherein said combination post arranged such as to be rotatable independent of said rotor assembly.
4. The cylinder lock according to claim 3, wherein said combination post is adapted for engagement by said key in order to facilitate rotation of said combination post by said key.

5. The cylinder lock according to claim 4, wherein said combination post includes additional combination holes angularly offset from said combination holes, said additional combination holes defining a parallel coding for said combination post.
6. The cylinder lock according to claim 5, wherein the combination post is adapted to be rotated with respect to said rotor assembly to a position where said parallel coding is aligned with said locking bars, whereby the lock can be operated by a key coded according to said parallel coding.
7. The cylinder lock according to claim 6, wherein said parallel coding is a master key coding.
8. The cylinder lock according to any one of the preceding claims, wherein said combination post is adapted to be removable from said lock.
9. The cylinder lock according to claim 8, including means for preventing said combination post from being removed at a first rotational position of said rotor assembly.
10. The cylinder lock according to claim 9, wherein said preventing means includes a setting pin having a fixed position on said rotor assembly with respect to said substantially parallel direction and is radially directed towards a setting hole arranged on said combination post, said setting pin being displaceable in a radial direction with respect to said axis, wherein said lock is adapted such that in said first rotational position of said rotor assembly said setting pin is displaced and engages said setting hole.
11. The cylinder lock according to claim 9 or 10, wherein said combination post is adapted to be removable at a second rotational position of said rotor assembly.
12. The cylinder lock according to claim 11 in combination with an appropriately coded removal key for facilitating rotation of the combination post

and the rotor assembly to said second rotational position in order to remove the combination post, said removal key being adapted to allow said removal key to be inserted into and removed from said lock in a first and at least a second rotational orientation, said first and second rotational orientation corresponding with said first and second rotational positions of said rotor assembly respectively.

13. The cylinder lock according to claim 12, wherein said combination post includes a removal channel running to the rear of said combination post, the removal key is appropriately coded so that upon entry of the removal key in the first rotational orientation a first locking bar of said plurality of locking bars is displaced, in said substantially parallel direction, to a position in which the locking bar pin of said first locking bar is directed towards said channel, wherein said lock is adapted so that when said removal key is turned to the second rotational orientation, whereby the rotor assembly is in said second rotational position, said first locking bar is radially displaced, so that the respective locking bar pin engages said channel, and the remainder of the pins of the lock are not in engagement with the combination post.

14. The cylinder lock according to any one of claims 8 to 13, wherein said lock is adapted to accept a replacement combination post when the combination post is removed from the lock.

15. A cylinder lock, including:

a housing having a cylindrical bore therein;

a rotor assembly rotatably mounted within said bore; and

a plurality of locking bars arranged on said rotor assembly, each locking bar including a locking bar pin directed radially inward towards the axis of said rotor assembly, wherein each locking bar is displaceable on the rotor assembly in a direction substantially parallel with said axis, and each locking bar is displaceable in a radial direction with respect to said axis;

said lock being adapted to accept a combination post arranged along said axis, said combination post having a plurality of combination holes formed thereon;

wherein each of said locking bars is adapted to be displaced by a coded key, in said substantially parallel direction, to a position in which the locking bar pin of each said locking bars is directed towards a respective combination hole; said rotor assembly is adapted to be rotated by said key to an unlocking position, wherein at various rotational positions each said locking bar is radially displaced towards said axis, thereby engaging each said locking bar pin with a respective combination hole, so as to permit rotation of said rotor assembly within said bore.

16. The cylinder lock according to claim 15, wherein said lock is adapted to allow said key to be inserted into and removed from said lock only when said rotor assembly is in a first rotational position.

17. The cylinder lock according to claim 15 or 16, wherein said combination post arranged such as to be rotatable independent of said rotor assembly.

18. The cylinder lock according to claim 17, wherein said combination post is adapted for engagement by said key in order to facilitate rotation of said combination post by said key.

19. The cylinder lock according to claim 18, wherein said combination post includes additional combination holes angularly offset from said combination holes, said additional combination holes defining a parallel coding for said combination post.

20. The cylinder lock according to claim 19, wherein the combination post is adapted to be rotated with respect to said rotor assembly to a position where said parallel coding is aligned with said locking bars, whereby the lock can be operated by a key coded according to said parallel coding.

21. The cylinder lock according to claim 20, wherein said parallel coding is a master key coding.

22. The cylinder lock according to any one of claims 15 to 21, wherein said combination post is adapted to be removable from said lock.

23. The cylinder lock according to claim 22; including means for preventing said combination post from being removed at a first rotational position of said rotor assembly.

24. The cylinder lock according to claim 23, wherein said preventing means includes a setting pin having a fixed position on said rotor assembly with respect to said substantially parallel direction and is radially directed towards a setting hole arranged on said combination post, said setting pin being displaceable in a radial direction with respect to said axis, wherein said lock is adapted such that in said first rotational position of said rotor assembly said setting pin is displaced and engages said setting hole.

25. The cylinder lock according to claim 23 or 24, wherein said combination post is adapted to be removable at a second rotational position of said rotor assembly.

26. The cylinder lock according to claim 25 in combination with an appropriately coded removal key for facilitating rotation of the combination post and the rotor assembly to said second rotational position in order to remove the combination post, said removal key being adapted to allow said removal key to be inserted into and removed from said lock in a first and at least a second rotational orientation, said first and second rotational orientation corresponding with said first and second rotational positions of said rotor assembly respectively.

27. The cylinder lock according to claim 26, wherein said combination post includes a removal channel running to the rear of said combination post; the removal key is appropriately coded so that upon entry of the removal key in the first rotational orientation a first locking bar of said plurality of locking bars is displaced, in said substantially parallel direction, to a position in which the locking bar pin of said first locking bar is directed towards said channel, wherein said lock is adapted so that when said removal key is turned to the second rotational orientation, whereby the rotor assembly is in said second rotational position, said first locking bar is radially displaced, so that the respective locking bar pin

engages said channel, and the remainder of the pins of the lock are not in engagement with the combination post.

28. A key structure, including:

a cylindrical body having radially extending projections arranged thereon; and

a rotator arranged within said cylindrical body;

said key being adapted to cooperate with a cylinder lock according to any one of the preceding claims;

wherein said projections are appropriately shaped and positioned whereby, upon insertion of said key into said lock, the locking bars are engaged and displaced by said projections, in said substantially parallel direction, to positions in which the locking bar pin of each said locking bar is directed towards a respectively associated one of said combination holes; said projections being further adapted to engage said rotor assembly in a manner whereby turning said key will cause the rotor assembly to rotate; and

wherein said rotator is adapted to engage the combination post in a manner whereby turning said key will cause the combination post to rotate.

29. The key according to claim 28, wherein said key is adapted to be inserted into and removed from said lock in only one rotational orientation of said cylindrical body and when said rotor assembly is in a first rotational position.

30. The key according to claim 28 or 29, wherein the combination post of the lock includes parallel coding, said rotator being further adapted to rotate said combination post, during insertion of the key into the lock, wherein upon full insertion of the key into the lock the parallel coding is in alignment with the locking bar pins of the locking bars.

31. The key according to claim 30, wherein said key is a master key.

32. The key according to any one of claims 28 to 31, wherein said projections are elongated in a direction generally parallel to the length of the cylindrical body.

33. The key according to any one of claims 28 to 32, wherein at least one of said projections is replaced by an actuator member having a coded portion, said actuator member being normally biased wherein said coded portion lies substantially within the cylindrical body, wherein, upon insertion of the key into the lock, part of the lock engages the actuator member, causing the coded portion to project from the cylindrical body and engage a respective locking bar.

34. The key according to claim 33, wherein the part of the lock which engages the actuator member is the combination post.

35. A removal key structure, including:

a cylindrical body having radially extending projections arranged thereon; and

a rotator arranged within said cylindrical body;

said removal key adapted to cooperate with a cylinder lock according to claim 12 or 26;

wherein said projections are appropriately shaped and positioned such that, upon insertion of said removal key in first rotational orientation of said cylindrical body into said lock when the rotor assembly is in a first rotational position, the locking bars are engaged and displaced by said projections, in said substantially parallel direction, to positions in which the locking bar pin of each said locking bar is directed towards a respectively associated one of said combination holes; said projections being further adapted to engage said rotor assembly in a manner whereby turning the removal key will cause the rotor assembly to rotate;

wherein said rotator is adapted to engage the combination post in a manner whereby turning said removal key will cause the combination post to rotate; and

wherein said key is adapted to be inserted into and removed from said lock in said first and at least a second rotational orientation of said cylindrical body, said first and second rotational orientation corresponding to said first and second rotational positions of the rotor assembly.

36. The removal key of claim 35, wherein the combination post of the lock includes a removal channel running to the rear of said combination post, a first of said projections is appropriately shaped and positioned to engage and displace a first of said plurality of locking bars, in said substantially parallel direction, to a position in which the locking bar pin of said first locking bar is directed towards said channel upon entry of said removal key into said lock in said first rotational orientation of said cylindrical body.

37. The removal key according to claim 35 or 36, wherein said projections are elongated in a direction running along the length of the cylindrical body.

38. The removal key according to any one of claims 35 to 37, wherein at least one of said projections is replaced by an actuator member having a coded portion, said actuator member being normally biased wherein said coded portion lies substantially within the cylindrical body, wherein, upon insertion of the removal key into the lock, part of the lock engages the actuator member, causing the coded portion to project from the cylindrical body and engage a respective locking bar.

39. The removal key according to claim 38, wherein the part of the lock which engages the actuator member is the combination post.

40. A combination post and key set for a cylinder lock according to any one of claims 15 to 27, said set including at least one combination post and at least one appropriately coded key.

41. A combination post and key set for a cylinder lock according to claim 14, said set including at least one combination post and at least one appropriately coded key, wherein said at least one combination post is a replacement combination post.

42. The combination post and key set according to claim 40 or 41, wherein said at least one combination post of said set includes parallel coding, said set further including at least one key appropriately coded for said parallel coding.
43. The combination post and key set according to claim 40 to 42, wherein at least two combination posts are provided with the same parallel coding, said set further including a master key appropriately coded for said same parallel coding.
44. The combination post and key set according to any one of claims 40 to 43, said set further including a removal key.
45. A cylinder lock substantially as herein described with reference to any of the accompanying drawings.
46. A key for cooperating with a cylinder lock substantially as herein described with reference to any of the accompanying drawings.
47. A removal key for cooperating with a cylinder lock substantially as herein described with reference to any of the accompanying drawings.
48. A combination post and key set for a cylinder lock substantially as herein described with reference to any of the accompanying drawings.
49. A combination post for a cylinder lock according to any one of claims 1 to 27.
50. A combination post for a cylinder lock substantially as herein described with reference to any of the accompanying drawings.